

## RP 902 Lean in an Operational Environment

The following recommended practice (RP) is subject to the disclaimer at the front of this manual. It is important that users read the disclaimer before considering adoption of any portion of this recommended practice.

This recommended practice was prepared by the AWEA Quality Committee. The committee would like to thank:

Primary Author: Scott Mathieu, EDP Renewables North America LLC

Contributing Authors:

Thomas Brazina, EDP Renewables North America LLC

Ryan Griffin, Mortenson Construction

Brandon Judish, NextEra Energy Resources

Gregory Lilly, E.ON Climate & Renewables North America

Fritz Oettinger, Vestas

Karen Tucker, Wanzek Construction, Inc.

The committee first authored this recommended practice as a separate whitepaper that was published on February 28, 2017.

### **Purpose and Scope**

The scope of “Lean In an Operational Environment” addresses applying lean concepts in wind site management operations.

### **Lean in an Operational Environment**

#### **1. Lean Overview**

##### **1.1. What is Lean?**

Lean is a set of tools and practices aimed at reducing waste and improving reliability. Waste is defined as any activity that consumes resources but does not add value to a particular process. It also includes any product that the customers are unwilling to pay for. By eliminating waste and non-value added time and activities, one can shorten the timeline from when the customer orders the product or service to when the customer receives the full value of the product or service. As the provider of the product or service, one can reduce labor, materials, and cycle time with the ultimate goal of improving customer satisfaction and business performance in multiple areas, such as safety, quality, cost, and on-time delivery.

### 1.1. What is Lean?

(continued)

Perhaps the best way to understand the concept of lean thinking is to consider an example from everyday life. Everyone is familiar with the daily process of brushing their teeth. The steps of the process include applying water and toothpaste to a toothbrush, rubbing the brush vigorously over our teeth, spitting out the wastewater, rinsing the toothbrush, etc. The steps that directly contribute to the desired process output of clean teeth and fresh breath are those that provide value to the customer, in this case yourself. The resources expended when rubbing the brush over your teeth are surely value adds. But what about the time spent searching for the toothpaste tube in the drawer? This provides no direct value to the customer, but consumes time and energy. Perhaps you discover that you are out of toothpaste and must walk down to a basement closet where you store the inventory of unopened toothpaste tubes. This is also wasted time and motion in the brushing process.

**Lean teaches us to first be aware of and identify the most common eight types of waste present in our processes.** Lean also gives us tools to reduce or eliminate those wastes, thereby increasing the efficiency of our process. Lean is:

- A working attitude with a bias for action
- Focusing on adding value and eliminating waste
- Continuous improvement

### 1.2. History of Lean

For centuries, manufacturing was a craftsman's job. Most fabricated items such as furniture, musical instruments, and weaponry were hand-made. This caused products to be very expensive, not replicable (each piece is unique), extremely variable in terms of quality, and highly dependent on the craftsmen that produced the product. As a result, affordability and mass production were unobtainable until the industrial revolution of the 1900s.